OVERSIGHT

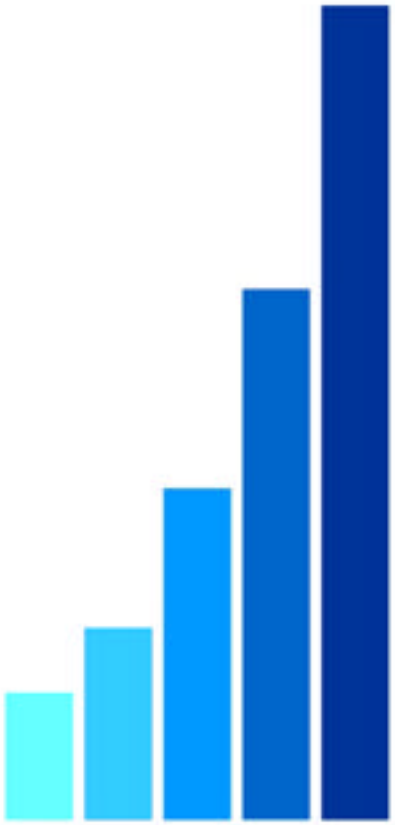
Interim Report on the Status of

Safeguards and Security

in the Department of Energy

Office of Oversight

Office of Environment, Safety and Health



November 1997

1.0 Introduction

The Office of Security Evaluations' profiles of the safeguards and security programs at major DOE sites concludes there is no immediate threat to the security of special nuclear material. However, significant security issues need to be resolved.

The Department of Energy Office of Security Evaluations, part of the independent Office of Oversight, has developed detailed and comprehensive profiles of the structure and effectiveness of protection programs at 13 major sites that possess most of DOE's inventory of special nuclear material. This special review was ordered by the Secretary of Energy following expressed public concerns about the possibility of theft or loss of such materials at certain sites. This report represents an interim unclassified summary of information contained in the 13 site profiles.

For each site reviewed, 12 to 15 security professionals conducted investigations that lasted up to one month. Their on-site activities included document reviews, interviews of key personnel, performance testing of security system elements, and real-time observation of security operations. These on-site activities were supplemented by off-site activities, including site-specific reviews of Headquarters documentation, interviews with Headquarters managers, and consideration of recent policy developments. As in all oversight assessments, management at each site reviewed and validated the data in each profile to ensure accuracy.

This report concludes that there is no immediate threat of theft for special nuclear material at any of the 13 DOE sites profiled. The profiles do, however, identify less-than-adequate security systems at four sites – meaning that some portions of the security system are performing below expectations. For example, response times to some target areas for some protective force responders may exceed that required by DOE-approved protection plans. At the remaining sites, the multiple layers of protection – including security clearances, access controls, sophisticated alarm systems, and armed, trained protective forces – provide adequate security margins. The summary also identified several areas that should be improved to maximize the effec-tiveness of the Department's protection program. At all sites profiled, management is aware of problems and is reportedly taking action to address them.

Detailed results of the site profile effort to date are reported in approximately 2,000 pages of classified material. To provide as much information to the public as possible, unclassified summaries of each site profile have also been prepared and will be available to the public.

This report first establishes a context for what follows by briefly describing DOE's approach to security, then presents preliminary conclusions regarding the overall status of the Department's safeguards and security program based on the profiles conducted to date. A brief unclassified status report on each site is also provided.

2.0 Safeguards and Security in the Department of Energy

DOE facilities must protect items essential to our nation's national security, including nuclear weapons, classified information, and government property.

The safeguards and security program in the Department of Energy is an essential support activity to the mission of the DOE. DOE facilities possess items that must be protected because they are essential to our nation's security and represent valuable property. Examples include:

- Nuclear weapons, nuclear weapons components, and special nuclear materials;
- Information that is important to national security; and
- Government property.

Organizational Responsibilities for Safeguards and Security

DOE's protection system depends on the four functions of direction, implementation, line management oversight, and independent oversight.

DOE's protection system depends on four independent functions operating effectively and in mutual support. The first of these is **Direction**. Someone must decide what is to be done, how it is to be accomplished, and what standards apply. These questions are answered by the public laws and regulations and DOE Orders, manuals, handbooks, guides, and other directive material produced by the Office of Security Affairs, under the Office of Nonproliferation and National Security.

The second of these is **Implementation**. Once broad direction defines goals, objectives, and expectations, someone must translate these into actions and provide the resources necessary to complete these actions. In the DOE, this role is filled by the Cognizant Secretarial Offices and Field Office Managers. These officials have the responsibility for managing broad operational areas such as stockpile maintenance and environmental restoration and, in the case of safeguards and security, they translate policy into action.

A successful protection program must have **Line Management Oversight**. Line management consists largely of those in the implementation chain. Line management safeguards and security oversight begins with self-assessments at the lowest levels, such as contractor self-assessments, and continues through field office surveys and Cognizant Secretarial Office reviews.

Finally, the DOE provides **Independent Oversight**. Oversight independent of the Cognizant Secretarial Offices is provided for environment, safety, health, safeguards, and security programs by the Office of Oversight. The Office of Oversight concentrates on program effectiveness, including the ef-fectiveness of the underlying policy and its implementation by the Cognizant Secretarial Offices.

The Graded Approach to Security

DOE has established a "graded" approach to security, whereby the more important assets receive increased protection.

As a practical matter, the DOE cannot provide complete assurance that every security interest is fully protected from theft, sabotage, or compromise. DOE has established a "graded" approach to security; this means that more important items get more protection. For example, a warehouse facility is not given the same level of protection as a nuclear weapon because it is "less important."

To implement this graded approach, DOE has developed formal processes to manage risk. The Department, in conjunction with other Federal agencies, has developed a specification for the number of adversaries that must be defeated, their characteristics, and their capabilities. This is called the Design Basis Threat. The Department has also developed a list of the most damaging acts that these adversaries might attempt and has identified the importance of each based on the impact of each of these actions on the national security, the health and safety of the workers, the public, and the environment. These important values, called "consequence values", reflect the relative severity of potential adversary acts.

Using the Design Basis Threat and these consequence values, each site analyzes its protection system. The protection provided for each target is evaluated against the adversary characteristics prescribed by the Design Basis Threat to determine the probability that the adversary would be successful. These probabilities are combined with the consequence of adversary success to determine the "risk" associated with accepting the system as is. Responsible managers approve the acceptance of the risk or direct improvements in the protection system until an acceptable level of risk is achieved. For the sites protecting the most significant national security assets, this process is formalized in a document called a Site Safeguards and Security Plan.

Layered Protection Systems

The DOE also employs a "layered" protection approach in which different protective layers are employed to offer the best chance of responding to a wide spectrum of threats.

The DOE must be prepared for many potential types of adversaries, ranging from a single person acting in a moment of anger to a well-planned, thoroughly rehearsed attempt to attack a facility. The DOE employs layered protection for its sites because a layered system offers the best chance of responding to this wide spectrum of threats. Each layer in a layered system is usually somewhat effective against every adversary act, but each is designed to be especially effective against particular adversary acts. For example, a layer can be designed to be very effective against "spur of the moment" acts in the workplace, even though it may be less effective against an armed adversary team penetrating into the work area. To compensate, the protection system design would include alarms, substantial physical barriers, and an armed protective force to defeat an outside adversary, even though these elements may be less effective against impulsive acts by employees.

3.0 Conclusions

Overall Protection of Assets

All sites visited have made progress toward resolving specific concerns, but each has other, unresolved issues to be addressed.

The 13 profiles completed to date confirm and update the results of Office of Security Evaluations inspections and assessments from the past several years. Every site visited has made noteworthy progress toward resolving specific concerns in its programs, but each also has other, unresolved issues remaining to be addressed. Four of the sites (Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Pantex Plant, and Rocky Flats Environmental Technology Site) have significant weaknesses that warrant immediate attention when viewed in light of the importance of the national security assets being protected. This is not to say that there were vulnerabilities that would have allowed an adversary to penetrate the facility, but rather that one or more of the layered elements of the protection system surrounding a very important asset had an exploitable weakness. Typically these weaknesses reduce the time available for protective force response or might lead to excessive protective force casualties in the event of an adversary attack. Of significance is the fact that the effectiveness of field element efforts in correcting identified shortcomings is often severely hindered by inconsistent and even conflicting policies and priorities established by DOE Headquarters. Even though such concerns merit immediate and sustained management attention, no single concern or combination of concerns were encountered which place special nuclear materials in immediate jeopardy.

Status of Security Planning Processes

DOE protection program management is centered upon the management of risk. The Design Basis Threat, developed in cooperation with national-level intelligence, investigative, and law enforcement agencies, characterizes the numbers, attributes, and capabilities of various potential adversaries that DOE security systems are expected to protect against. DOE has also defined a methodology for quantifying risks to national security assets, including the assignment of numerical values to the consequences of failure to protect individual assets. DOE protection systems are expected to provide a level of protection, and to demonstrate that level of protection through both modeling and performance testing, such that the risk to each asset is below the mandated level. Periodic measurements, including analyses and performance tests of system effectiveness, are to be made during oversight activities to confirm that the risk remains at or below the agreed level.

The risks to significant quantities of special nuclear material are delineated and formally accepted by DOE managers in a document called the Site Safeguards and Security Plan. This document describes the site protection program in detail, and is used as the baseline against which the effectiveness of the site protection program is evaluated.

Most sites maintain ongoing vulnerability assessment, performance testing, and planning programs.

The 13 sites profiled are responsible for producing 20 Site Safeguards and Security Plans covering key facilities at their sites. Of these 20, eight have completed the annual concurrence and

acceptance cycle on time. Some are as much as three years out of date. It was determined during profiling of these sites that none of the 12 out-of-date plans were the result of inactivity on the part of the site or local DOE managers. Rather, the delay is largely attributable to an inability to obtain concurrence by both the Cognizant Secretarial Office and the Office of Nonproliferation and National Security. Most sites profiled maintain an ongoing vulnerability assessment, performance testing, and planning activity. All were able to provide a recently revised draft of site plans that reflected the current situation, even when overall plan approval was delinquent.

However, the sites are not completely without fault for this situation. Even though all 13 sites profiled maintain this ongoing planning effort, there were inconsistencies among sites in the process. The techniques employed, assumptions made, and level of detail applied to the analysis of security system effectiveness, as well as the rigor applied to the actual testing of system effectiveness were inconsistent among sites. These inconsistencies and deficiencies contribute in some cases to Headquarters' reluctance to provide timely concurrence. An additional consequence is that similar claims in various Site Safeguards and Security Plans regarding protection system effectiveness do not necessarily equate to equivalent levels of protection.

Status of Physical Security Systems

Electronic detection and assessment systems are reaching the end of their useful lives and are being replaced at many sites with a standardized alarm processing system.

It is generally acknowledged that electronic detection and assessment systems at many sites are reaching the end of their useful lives. In most cases, the current systems remain effective due to intensive maintenance programs. However, the cost of maintaining these systems is steadily increasing, and some sites are experiencing difficulty in obtaining parts.

Moreover, a number of sites profiled have significantly reduced their preventive maintenance programs.

Replacement of aging components is proceeding, generally accompanied by the installation of ARGUS (a standardized, computer-based, integrated alarm processing and assessment system). While standardized systems can result in substantial benefits such as cost savings based on economies of scale and uniformity of training requirements, the realization of these benefits requires Headquarters management and system integration. For example, every site that is planning to adopt ARGUS has concerns about the implementation and costs of parts procurement, software maintenance, and resolution of concerns between users and the laboratory chosen as the supplier of these services. Only Headquarters can serve as an honest broker to resolve these concerns, but its role to date has been primarily devoted to promoting the adoption of ARGUS at the various sites. At the present time, the remaining elements of the protection system are robust enough to compensate for the undeniably aging electronic detection and assessment systems. However, continued delay in their replacement will increase operating costs and, eventually, decrease the safety margin in protective systems.

At three of the four sites which have significant weaknesses, various combinations of local procedures, a limited ability to detect certain adversary actions, and limited use of delay elements reduce the time available to the protective force to respond effectively after detection, thereby reducing the security margin below the level mandated by DOE. The most pervasive shortcoming was the implementation of various local policies intended to allow freer access to formerly restricted areas. These procedures were implemented to accommodate a number of desires, such as: presenting a more "campus-like" environment to facilitate the growing level of cooperation among DOE facilities, academic, and industrial partners; reducing the costs of bringing uncleared personnel on-site to conduct decontamination and decommissioning activities; and facilitating the routine entry of staff or site contractors. While these goals are each valid and desirable in an appropriate context, the procedures used to implement them have the potential to allow uncleared or unauthorized persons to bypass the outer detection and delay systems that provide the first line of defense for special nuclear material production and storage locations. Such procedures were a factor in reducing the safety margin at two facilities at which immediate concerns were identified.

Additionally, two sites with reduced safety margins had not fully addressed specific deficiencies that could potentially allow unauthorized persons to traverse their barrier and sensor systems undetected. This becomes a particular concern when the resulting adversary path to the target material does not present significant physical barriers that might provide detection during the attempt to breach them and/or might provide a sufficient delay to allow effective protective force response.

Status of Protective Forces

The average age of protective force staff is increasing; however, this increase does not currently impede duty or mission accomplishment.

Overall, the average age of protective force personnel at Departmental facilities is increasing. This is due in part to downsizing efforts throughout the Department, which often results in the retention of older personnel with more seniority and the release of younger personnel with less seniority. However, information developed during site profiling activities, including observation of physical fitness testing and, in some cases, tactical exercises, indicates that the age of the force does not currently impede performance of duties or mission accomplishment.

Most protective forces reviewed have downsized in the last five years, some by as much as one-third. Much of this downsizing has resulted from site changes such as the consolidation of security assets, the elimination of security areas, the elimination of some

ancillary duties, and the introduction of automated access control equipment at locations that were previously manned by protective force personnel. Residual protective force manning was found to be adequate for mission requirements; however, at a few facilities it appeared that further reductions would be ill-advised, or that the portion of the force devoted to the most critical security areas was inadequate. In particular, some sites need to reevaluate their response plans and modify protective force response positions with an eye toward ensuring the rapid build-up and advantageous placement of sufficient force near critical target areas.

Status of Nuclear Material Control and Accountability

Material control and accountability issues involve problems with nuclear material holdup, material inventory measurements, and computerized accountability system implementation.

Several issues emerged in the area of nuclear material control and accountability, the security discipline that employs various measurement, inventory, access control, and process control techniques to keep track of special nuclear materials at all times – such as a bank keeps track of money. Nuclear material holdup remains an issue at several sites. The word "holdup" refers to nuclear material (generally plutonium or enriched uranium) in various physical forms that has accumulated over the years in inaccessible (or difficult to access) piping, ventilation ducting, and other process equipment. Often it is unmeasured and sometimes unmeasureable, so precise amounts, and even precise locations of the material may not be known. This is a difficult issue that needs to be addressed; holdup needs to be identified and measured, and plans for dealing with it need to be developed. Due to the nature of the problem, it is a safety concern as well as a security concern. As facilities are being decontaminated, decommissioned, and de- molished, holdup could present a potential environmental hazard as well as a health risk to workers.

Similarly, some long-standing difficulties in measuring some portions of special nuclear material inventories persist. These include lack of appropriate measurement equipment, hazards associated with conducting measurements with available equipment and methods, and resources or procedures that do not accommodate all required measurements. These difficulties stem from the fact that DOE possesses significant amounts of nuclear material in unique physical forms, including mixtures with other materials, which do not easily lend themselves to accurate measurement. Material measurements, however, are an important element of the system relied upon to ensure that special nuclear material is accounted for and has not been stolen or diverted.

DOE has initiated an effort to address issues related to nuclear material measurement, holdup, and accountability. These efforts have had some success, but need continued management attention.

Finally, the adoption of LANMASS (a computerized central nuclear material control and accountability system envisioned for adoption as the accounting standard throughout the Department) is a key element in the Department's strategy to achieve a number of enhancements in nuclear material control and accountability. However, implementation is proving to be both slow and expensive. The major problems encountered are associated with the fact that, due to the uniqueness of some of the materials possessed by many sites, those sites are faced with the need to customize the standard (LANMASS) system in order to accommodate their needs. As with other systems previously mentioned, prolonged delay in implementation of LANMASS will likely result in increased costs and diminishing system effectiveness.

Adequacy of Safeguards and Security Resource Management

Safeguards and security managers have been generally effective in maintaining adequate protection with reduced resources.

The Department has had to adapt to funding and other resource reductions in recent years, and safeguards and security programs have not escaped the effects of those reductions. However, safeguards and security managers in the field have been generally effective in maintaining adequate protection with reduced resources. In some cases, as previously discussed, overall downsizing and consolidation efforts reduced some security requirements. In other cases, more cost-effective, and often less manpower-intensive methods were found to meet requirements. Few significant issues or weaknesses were found to have been caused by a lack of resources. Of those weaknesses observed, the source was almost always found in either Headquarters-directed priorities that caused inefficient use of security resources, vague policy, failures by Headquarters managers to support existing policy, or disagreement among Headquarters entities as to the level of residual risk that should be accepted.

A few key projects involving physical security system improvements that will have major impacts on site protection remain to be funded. In addition, some similar projects already underway require additional support. It will be important for senior managers to continue to adequately fund such key projects, and to provide consistent management support until they are completed. Otherwise, they may be discarded or curtailed in the effort to accommodate shrinking budgets.

Finally, a Department-wide resource-management issue involves a flawed means of monitoring resource expenditures. DOE does not have a specific security budget; security items are funded, normally as part of overhead expenses, from the budgets of program areas (such as Defense Programs, Environmental Management, etc.) that are responsible for funding site operations. Consequently, in order to estimate total safeguards and security program costs, the Office of Nonproliferation and National Security assembles a Departmental crosscut budget estimate based on submissions from the field detailing what they are planning to spend (or have spent) on safeguards and security. Profiles indicate that in some cases the budget estimates submitted are incorrect by as much as a factor of two because of misinter-pretations of the submission instructions. Such inaccuracies are not universal, but the result is that total program costs contain significant uncertainties.

Inadequacy of Radiological Sabotage Policies

Not all credible radiological sabotage scenarios have been considered and analyzed; therefore, protection of nuclear materials from sabotage may not be sufficient.

Deficiencies in policy guidance from Headquarters organizations adversely impact protection programs. It has a particularly adverse effect on programs to protect against radiological sabotage. (Radiological sabotage is the malevolent release of harmful amounts of radiation or radioactive matter into the atmosphere. To commit radiological sabotage, an adversary would generally have to gain hands-on access to appropriate nuclear material, and maintain control of the material long enough to complete the act of sabotage – a time requirement that varies with the form, amount, and location of the material). The profiles indicate that not all credible radiological sabotage scenarios have been considered, and that security systems geared toward protection from theft may not be sufficiently effective in preventing sabotage.

Further, at some sites, the capability to quickly recover or recapture target material is questionable. Radiological sabotage policy does not ensure that all credible risks are evaluated. Additionally, the Department has not issued policy that adequately addresses the on-site consequences of potential radiological sabotage.

Deficiencies in protection against radiological sabotage and the failure to adequately analyze some scenarios indicated in the profiles are a direct result of Headquarters not defining and following a comprehensive and consistent set of requirements. Clear and unambiguous policy should be established, and then imple-mented throughout the Department.

Status of Information Protection

Protection of classified and sensitive unclassified information has been generally effective; however, continued vigilance is needed to counter the increasing threat in the area of computer security.

The protection of classified information in the DOE is in many respects a success story. The DOE has, over the past five years, brought its program for the protection of classified material into close alignment with other government agencies, assuring that data is provided equivalent protection wherever it may reside. In the process of doing so, the DOE has reduced the costs associated with document accountability, has declassified large numbers of documents, and has redefined the physical protection required for material classified at various levels. Most of the sites visited had conducted campaigns that greatly reduced their classified holdings and consolidated the remaining holdings into fewer accounts in fewer locations. These campaigns have generally improved security and reduced cost. At the same time, many sites have addressed long-standing classified computer security issues regarding classified networks and classified stand alone computers, with the result that no significant classified computer security issues have been identified during the profile effort.

Similarly, significant progress has been observed in the protection of sensitive, unclassified computer systems. The nature of the DOE mission is such that users of unclassified DOE computers are distributed worldwide, are citizens of many countries, and require routine access. This is balanced by the requirement to protect proprietary, personal, and otherwise sensitive information that may reside on DOE computers. Simultaneously addressing these two needs has been and continues to be a significant challenge for the managers of DOE unclassified computer systems. Although the results of these profiles indicate that substantial progress has been made in reducing the vulnerability of sensitive, unclassified data on DOE computers, weaknesses continue to be observed. Continued vigilance and additional enhancements will be necessary to counter the increasing competence and technological capabilities of potential adversaries.

Inconsistencies exist between requirements for protecting classified materials (e.g., weapons parts) and those for protecting documents.

Profiles indicate that an area of concern identified by Security Evaluations a number of

years ago has not yet been adequately addressed. DOE classified information includes very specific and detailed information on the design, construction, and performance characteristics of a number of advanced nuclear weapon designs. The sensitivity of this data is not well addressed by the policy regarding physical protection of classified material (parts, etc.), as there are inconsistencies in protection requirements for documents and parts (or other materials) containing the same information. For example, DOE policy requires a greater level of protection for a document describing some classified nuclear weapons components than it does for the components themselves, even though the same information could be obtained from the component. Protection (storage) requirements for classified parts do not ensure protection commensurate with the sensitivity of some of these classified materials. DOE has required that sites conduct vulnerability assessments to determine the vulnerability of such data (contained in parts, etc.) and to determine and provide the appropriate physical protection. Profiles of a number of sites with such information indicate that this has not been done and, consequently, this material is not provided the required protection.

4.0 Needed Program Improvements

The underlying root cause for most of the specific issues identified can be attributed to the lack of unified safeguards and security program direction and implementation.

An analysis of safeguards and security program status as described in the profiles reveals an underlying root cause to which most of the various specific issues that have been identified can be attributed: the lack of unified safeguards and security program direction and implementation within the Department. The adoption and management of unified program direction and implementation is the single most important improvement that could have both immediate and long-term positive effects. Specific actions that are indicated include:

- **Acknowledge Single Policy Source**. Program offices and the field need to acknowledge that the Office of Nonproliferation and National Security is the sole organization responsible for the promulgation of safeguards and security policy. The Department needs to speak with one voice, rather than with conflicting voices, regarding safeguards and security policy. In order to establish and maintain an appropriate security posture throughout the Department, policies, once appropriately established, must be applied without unwarranted dissent or divergence.

- **Recognize Programmatic and Field Interests**. Field Managers repeatedly expressed that the Office of Nonproliferation and National Security needs to acknowledge and act upon the concept that program office and field element comments and input need to be considered and factored into policy development when appropriate. Safeguards and security policies, like any other policies, are influenced not only by security needs but by broader Departmental imperatives as well. Further, program offices largely fund the implementation of safeguards and security policies and field elements bear the burden of actually implementing the policies. Consequently, both of those entities should be legitimately entitled to a voice in the formulation and modification of safeguards and security policies.

- **More Effective Policy Implementation**. Once policy is promulgated, program offices and field elements need to work together to implement policy in a timely manner.

- **Address Policy Shortcomings**. Immediate policy resolutions are needed in the following areas, which the profile process has identified as policy weaknesses that result in significant or widespread safe-guards and security program deficiencies:

  - **Radiological sabotage**. A clear and consistent policy is needed, to include a definition of what acts are to be considered radiological sabotage, whether on-site consequences are to be considered in protection decisions, and what consequence values will be used in risk calculations.

  - **Analysis, validation, verification, and approval of Site Safeguards and Security Plans**. Policy should include guidelines for the Site Safeguards and Security Plan process that ensure a product that, although site-specific in detail, is

standard across the Department in its quality and reliability. That would promote and support an accelerated concurrence/approval process.

- **Design Basis Threat**. The current situation, in which various Department elements adhere to different editions of the Design Basis Threat, or to those portions that they care to adhere to, must be remedied so that Departmental resources are devoted to providing the level of protection directed by the Department.
- **Recapture and recovery**. It is important that all Departmental elements clearly understand what is expected of them regarding the recapture and recovery of nuclear devices and materials. If such a requirement should ever arise, the time available for reaction will likely be so quick as to allow time only for the execution of established plans; there will be no time for clarifications of policy/authority/ expectations.

5.0 Site-By-Site Results

This section summarizes the major protection and management issues at each of the 13 sites profiled to date. Although classification considerations preclude detailed discussion of many of these issues, the summary results presented in this section should permit overall conclusions to be drawn concerning the status of safeguards and security programs at each site; details of specific issues may be found in the appropriate site profile.

Argonne National Laboratory-West

Argonne National Laboratory-West is a complex of laboratories, research installations, and administrative buildings located in southeastern Idaho. Although located on the reservation of the DOE Idaho National Environmental Engineering Laboratory, Argonne National Laboratory - West is a component of DOE's Chicago-based Argonne National Laboratory, a University of Chicago operated facility dedicated to nuclear research and development. The original Argonne National Laboratory - West mission revolved around the testing and development of advanced nuclear reactor technology. Although this original research mission has been terminated, Argonne National Laboratory - West retains significant quantities of special nuclear material in attractive forms as a legacy of this mission. Argonne National Laboratory - West possesses only limited amounts of classified or sensitive information.

There were no significant weaknesses noted in the overall implementation of the safeguards and security program at the Laboratory.

Noteworthy progress was found in the areas of correction of the specific problems noted in the 1992 and 1996 Security Evaluations assessments. In addition, overall protection effectiveness was found to have been significantly improved, especially by the recent development of an in-house special response team capability.

Several issues were found warranting management attention. The first of these concerns the need for more extensive and rigorous performance testing of the protection measures used to protect unclassified computer security systems. Second, enhancements to the nuclear material accounting system and the nuclear material measurement program require continued emphasis. Another issue concerns the need to more completely analyze potential consequences associated with a sabotage attempt during the movement of radiological or toxicological materials. The final management issue relates to the need for a procedure for the removal of Personnel Security Assurance Program-designated individuals from program duties whenever annual program certification requirements are not met. Each of these issues represents an area in which the Laboratory's safeguards and security management can achieve further program improvements.

Hanford Site

The Hanford Site is located in south central Washington State near the city of Richland, on the Columbia River. The current mission at the Hanford Site combines decontamination and decommissioning of facilities formerly used for plutonium production and the environmental restoration of the site as a whole. Although Hanford has made a concerted effort to reduce or eliminate its holdings of special nuclear material and classified material, substantial holdings in both categories still remain. Hanford has reduced the overall demands of the safeguards

and security program at the site through its efforts to concentrate these national security assets at a limited number of locations.

There were no significant weaknesses noted in the overall implementation of the safeguards and security program at the Hanford Site. The Hanford Site made noteworthy efforts to consolidate national security assets at a limited number of locations. These efforts are largely complete, though additional consolidation will be achieved through the planned removal of material from an area.

Issues requiring management attention include the delay in removal of material from an area, thereby prolonging the site exposure to some adversary scenarios and weaknesses that were found in the protection afforded to some non-special nuclear material radioactive materials against radiological sabotage.

Idaho National Engineering and Environmental Laboratory

The Idaho National Engineering and Environmental Laboratory occupies approximately 890 square miles on the Snake River plain about 46 miles west of the city of Idaho Falls, Idaho. Additional administrative and research facilities are located in several buildings in Idaho Falls. The Idaho National Engineering and Environmental Laboratory's current mission is to apply engineering and scientific capabilities in support of national defense and energy programs. In addition to research and development, major tasks include reactor operation, reactor fuel testing, storage and handling of special nuclear materials, and radioactive waste management.

DOE security interests at the Idaho National Engineering and Environmental Laboratory include: Category I quantities of highly enriched uranium, other Category II or lower quantities of special nuclear materials, approximately 30,000 documents and items classified up to Top Secret, two classified special access programs, and approximately 100 computers and ten local area networks processing data up to Secret/Restricted Data.

There were no significant weaknesses noted in the overall implementation of the safeguards and security program at the Idaho National Engineering and Environmental Laboratory. Noteworthy progress was identified in the protection of information and in nuclear material control and accountability. Weak-nesses noted in these areas during the 1993 Security Evaluations assessments were generally addressed. In addition, there has been a significant reduction and consolidation of special nuclear material, allowing economies to be realized in the protection program. Additionally, alarm-monitoring stations are being consolidated and new monitoring and control equipment is being installed in Protected Areas.

One issue requiring management attention is the trend of performance testing results that indicated that reductions in the protective force and in access controls have reached a critical point in which further reductions may cause unacceptable consequences. Also, while progress has been made in correcting unclassified computer security weaknesses, much remains to be done before a fully effective protection program for sensitive unclassified information – such as proprietary technological and personal information – is achieved.

Lawrence Livermore National Laboratory

Lawrence Livermore National Laboratory is located near the city of Livermore, California, approximately 45 miles east of San Francisco. The current mission of the Laboratory is to solve complex scientific and technical problems of national importance. The Laboratory pos-sesses 4,300 plutonium and enriched uranium items in the form of metals, weapons parts, weapons assemblies, oxides, and waste, some of which are considered by DOE as potential radiological sabotage targets. Classified holdings consist of the equivalent of over two million documents, mainly in 1,400 classified computer systems with over 800,000 documents and items, including 3,200 non-nuclear weapons parts and tooling.

While Lawrence Livermore National Laboratory is currently in the process of upgrading protection of security interests, significant program weaknesses, some of immediate concern, continue to exist.

Noteworthy progress was found in the classified and unclassified computer security programs as a result of positive management emphasis and support. Similar improvement has taken place in the nuclear material control and accountability program.

Significant issues remaining involve the protection of special nuclear material which has degraded in the past two years, most notably by the reduction in protective force capabilities resulting from downsizing and redeployment. The Laboratory has responded with temporary measures designed to improve the protective posture until permanent solutions can be implemented.

Los Alamos National Laboratory

The Los Alamos National Laboratory is located on the Pajarito Plateau of the Jemez Mountains, about 15 miles northwest of Santa Fe, New Mexico. The Laboratory's mission is to provide technical assistance to the DOE complex, operate certain nuclear weapon production facilities, perform basic research to support its own programs, and support the DOE's research mission. The Laboratory also performs work for other federal agencies, including the nation's defense and intelligence agencies.

Significant programmatic weaknesses were found in the safeguards and security program, particularly in the areas of radiological sabotage and protection of weapons-related parts and assemblies.

Los Alamos National Laboratory possesses large quantities of weapons-grade nuclear materials. Classified holdings, classified up to and including Top Secret, consist of over 7,300,000 classified documents and over 300,000 non-nuclear classified weapons parts, and include information generated in various intelligence programs. There are also approximately 100 programs involving classified work for other federal agencies. Classified information is processed on over 2,000 computer systems, 1,600 of which are multi-user systems processing data up to the Secret level.

Noteworthy progress was found in the marked increase in safety awareness within the protective force since the fatal protective force training accident in 1994. Also, the infrastructure of the document control program at the Laboratory showed improvement and the Laboratory, under the guidance of the Albuquerque Operations Office, has made significant improvements to the classified computer security program.

Significant issues were found in several areas. In general, some of the facilities used for newly assigned efforts in support of the nuclear stockpile maintenance and assurance activities are deficient in physical security system components such as alarm systems, delay systems, and barriers. Increased use of the protective force provides a short-term solution, and system upgrades currently programmed address many of these issues for the long term. However, some weaknesses cannot be mitigated by protective force deployments, and even the planned upgrades will not address all concerns.

Recently, as a part of their ongoing effort to provide current and increasingly accurate vulnerability analyses to support safeguards and security planning, Los Alamos and DOE experts identified some previously unrecognized scenarios in which adversaries might successfully obtain and disperse a sufficient quantity of radioactive material to achieve small, but unacceptable, radiation exposures. In the identified scenarios, the adversary would need to be very determined and would need detailed and accurate knowledge of facilities and operations that could only be obtained from a limited number of employees. Furthermore, there would only be certain days in which the weather conditions would allow a successful dispersion. Nevertheless, for these scenarios, the Los Alamos protection system does not currently provide the level of assurance that DOE requires.

Los Alamos experts, in consultation with security experts from the DOE Los Alamos Area Office, Albuquerque Operations Office, and

DOE Headquarters, are formulating compensatory measures that will provide an increased level of security until a series of recently approved upgrades can be installed. These compensatory measures will range from changes in protective force response procedures to significant enhancements to some security systems. In addition to emphasizing both the temporary compensatory measures and the permanent system improvements, Los Alamos management also needs to place greater emphasis upon the analysis of protection system effectiveness against the full range of potential threats described in DOE policy.

A second issue pertains to the protection provided to classified weapons components. During a 1994 inspection of Los Alamos, the Office of Security Evaluations identified that some classified non-nuclear parts of nuclear weapons with potentially high values to proliferant nations or other groups wishing to acquire nuclear weapons technology were not being protected in accordance with their sensitivity. This was found to reflect a shortcoming in the DOE policy addressing the protection of classified information. The DOE Headquarters organization responsible for the policy subsequently took appropriate action to identify and direct several protective measures to be taken until the applicable DOE order is revised. DOE Albuquerque forwarded this direction to Los Alamos in 1995 and with a follow up memorandum in 1996. However, Los Alamos has not taken appropriate action to correct the situation.

A third issue relates to the difficult question of industrial sabotage. As DOE nuclear facilities are decontaminated, decommissioned, and closed, the facilities at Los Alamos that support nuclear stockpile maintenance and assurance may take on added significance in maintaining the operability of the nation's remaining stockpile of nuclear weapons. This reopens the issue, long dormant within DOE, of the role of facilities such as these as potential industrial sabotage targets. Los Alamos has recognized this potential and has begun the analyses necessary to include these factors and the need to address industrial sabotage in its site security planning. However, since this is inherently a complex-wide issue, DOE weapons program managers should carefully identify and evaluate viable protection alternatives in order to avoid incurring substantial security costs while at the same time possibly failing to achieve the protection assurance desired.

Nevada Facilities

The facilities administered by the Nevada Operations Office are mainly concentrated in southern Nevada, in the vicinity of Las Vegas. These facilities include operations office and contractor administrative offices in North Las Vegas, the Remote Sensing Laboratory on the nearby Nellis Air Force Base reservation, and the Nevada Test Site, located in the desert 65 miles northwest of Las Vegas. The Nevada Test Site encompasses approximately 1,350 square miles. It is situated in a remote area with restricted access that is buffered from the public on three sides by the Nellis Air Force Base Bombing and Gunnery Range, which represents an additional 4,120 square miles of federally owned, restricted access property.

From 1951 until 1992 the principal mission of the Nevada Operations Office and the Nevada Test Site was the conduct of nuclear explosive testing. Although resumption of this test mission is not anticipated, the Nevada Operations Office continues to be responsible for maintaining the capability to resume such testing should the need ever recur. At present, Nevada Test Site facilities are being employed in a program of sub-critical nuclear tests designed to obtain additional technical information without full-scale weapons testing. In addition, the Nevada Operations Office has undertaken adjunct mission responsibilities in areas such as stockpile stewardship, crisis management, environmental management, and scientific and technical development. Other missions include support for the DOE Nuclear Emergency Search Team.

No significant weaknesses were noted in the overall implementation of the safeguards and security program at Nevada Operations Office facilities. Noteworthy progress includes the

conversion of the operations office's unclass-ified computer security program, a long-standing program weakness, to a distinct program strength. Additionally, enhancements to the Personnel Assurance Program, including additional background checks and interviews, represent significant improvements in an already well-implemented program.

The development of the Mobile Intruder Response Vehicle, a state-of-the-art surveillance vehicle specially adapted to the needs of field security operations at the Nevada Test Site, is yet another accomplishment. The outstanding performance capabilities of this vehicle have captured the attention of other law enforcement and security agencies, most notably the FBI.

Above all, the impending activation of the Device Assembly Facility represents a signif-icant advance over traditional special nuclear material facilities. The protective features built into the Device Assembly Facility equal the best found anywhere in the DOE complex, and the integration of detection, delay, and tactical response features significantly enhances the ability of the protective force to effectively counter potential hostile actions. Although some work remains to be done in the area of alarm processing before the facility is fully operational, it already represents an important accomplishment for the operations office's safeguards and security program, and it also represents an impressive new asset for the DOE as a whole.

Given the present safeguards and security mission at the Nevada Operations Office, there are currently no significant issues. Due to uncertainty regarding the nature and scope of future operational missions —particularly at the Nevada Test Site—the safeguards and security program management issue receiving the most attention involves program planning require-ments to meet various proposed future missions.

Pantex Plant

The Pantex Plant is located on open rangeland just east of Amarillo, Texas. The Plant's mission is to assemble or disassemble complete nuclear weapons from components fabricated at other DOE facilities. In recent years the emphasis has shifted from assembly to disassembly as the nation reduces its overall weapons inventory in accordance with inter-national treaty commitments. Currently, Pantex is also staging significant numbers of nuclear components pending decisions concerning their final disposition. Pantex possesses large quantities of weapons-grade nuclear materials and complete weapons assemblies. Classified holdings at Pantex are also significant.

The Pantex safeguards and security program is generally well planned, comprehensive, and effective, but some significant weaknesses with potentially serious consequences continue to exist. Noteworthy progress included imple-mentation of a number of initiatives and improvements over the past several years. Construction of major security improvements is underway, storage strategies have been improved, and there is evidence of continuing management support for the safeguards and security program.

The most significant issues involve the construction associated with security system upgrades. Pantex personnel were inactivating key security systems to facilitate construction operations. When this was pointed out to Pantex managers, immediate compensatory action was taken.

Portsmouth Gaseous Diffusion Plant

The Portsmouth Gaseous Diffusion Plant is located in south central Ohio, approximately 90 miles south of Columbus. DOE's current mission for the Plant is to complete the highly enriched uranium refeed/suspension, environ-mental restoration, and waste management programs. Additionally, the mission of the United States Enrichment Corporation, also located at the Plant site, is to produce low-enriched uranium for commercial nuclear power plants. The Plant possesses large quantities of highly enriched uranium items in the form of uranium hexaflouride, uranium oxides, and uranium scrap. Classified holdings consist of 134 documents, 5,000 to 6,000 (non-nuclear)

parts, and about 100 personal computers and terminals that process classified information.

The Portsmouth Plant has a unique position within the DOE in that most of its operations have been assigned to the United States Enrichment Corporation; regulated by the NRC. However, significant quantities of the DOE's highly enriched uranium are stored on site, and DOE continues to be responsible for security of this material until it is transferred off site or is "blended down" so that it no longer requires the higher degree of protection afforded to highly enriched uranium. DOE plans to achieve this goal within the next two years, allowing the NRC to thereafter assume sole responsibility for the site assets.

Very few weaknesses were identified in safeguards and security program implementation. Significant progress was noted in the development of comprehensive plans for the disposition of all highly enriched uranium in its inventory. At present, disposition efforts are ahead of schedule. The safeguards and security program elements at the Plant provide adequate protection to special nuclear materials. Classified and sensitive information is also effectively protected. The Plant's computer security programs demonstrate strengths that indicate unusually strong protection features.

The one significant issue noted concerned the transition from DOE to NRC responsibility. Transition-related issues in areas such as computer security program oversight and accountability of the special nuclear material remaining in processing equipment require management attention to ensure DOE assets are adequately protected until NRC ultimately assumes responsibility.

Rocky Flats Environmental Technology Site

The Rocky Flats Environmental Technology Site is located near Denver, Colorado. The current Rocky Flats mission is the decontamination and decommissioning of facilities once associated with the production of plutonium components for nuclear weapons and the environmental restoration of the Rocky Flats site. However, Rocky Flats continues to retain significant quantities of special nuclear material, including both plutonium and highly enriched uranium. Rocky Flats also possesses significant numbers of classified documents and classified tooling and parts.

While many long-standing safeguards and security program weaknesses are currently being addressed, persistent concerns remain in certain areas.

Noteworthy progress was noted in the areas of physical security systems, self-assessments, and performance testing. Recent organizational enhancements of the integrating contractor's safeguards and security organization were beginning to bear fruit in the form of improved attitudes among subcontractors, improved program integration, and improvements in contractor self assessments. A significant reduction in classified documents and materials has occurred and consolidation of the remaining items into more secure locations is continuing.

Significant issues included some specific weaknesses in the protection of special nuclear materials, a persistent lack of confidence in the safeguards and security system, and inconsistent management emphasis. The profile noted that DOE protection standards were not being met with respect to the protection of special nuclear materials against theft, protection of classified information, and radiological sabotage. The most urgent deficiencies were primarily the result of flawed administrative procedures. In response to these concerns, Rocky Flats management has already initiated a review of these procedures and is in the process of developing revisions that will correct the identified deficiencies.

The underlying issue at Rocky Flats has been lack of confidence in the ability of the safeguards and security system to perform as designed and lack of confidence in the ability of the Rocky Flats management to identify system weaknesses and to fix them in a timely manner. The evidence developed during the profile underscored the point that the safeguards and security programs at Rocky Flats required consistent management emphasis, rather than "on again, off again" support. The safeguards and security program

needs stability, strong leadership, and improved coordination with site operations in order to achieve success. Furthermore, senior management needs to send a strong signal to the entire site community that safeguards and security is an integral element in the larger environmental restoration and closure mission, rather than an impediment to the achievement of that mission.

Sandia National Laboratories/New Mexico

Sandia National Laboratory/New Mexico is located on the Kirtland Air Force Base military reservation, 6.5 miles east of Albuquerque, New Mexico. The Laboratory is a DOE multi-program national Laboratory, performing a broad range of missions, including engineering development and systems integration work to support the U.S. nuclear weapons program. Security interests include large quantities of nuclear materials, the majority of which is highly enriched uranium. Other security interests on site include classified and sensitive information in the form of documents, parts, and electronic media, and government property. These classified information holdings are substantial, numbering over one million classified items and including a large number of documents classified Top Secret.

No significant weaknesses were noted in safeguards and security program imple-mentation.

Noteworthy progress was found in the areas of cross-training of the safeguards and security staffs, reorganization and consolidation of program functions to eliminate duplication of effort, and the conduct of assistance reviews by the Albuquerque Operations Office to address specific areas of concern at area offices and contractor facilities. Laboratory initiatives in-clude the reduction and consolidation of special nuclear material holdings, the installation of automated access control points, encryption of transmissions over computer networks, in-creased security training for laboratory managers and staff, and the upgrade of physical security elements to enhance long-term system performance.

The one significant issue involves the integration of the safeguards and security program into the changing business envi-ronment at Sandia National Laboratory/New Mexico, specifically the need to balance security effectiveness against the need to handle increased quantities of sensitive information, and to employ the capabilities of larger numbers of foreign scientists and technicians. This has led to increased pressure to create a more open, campus-like research environment, even at locations where special nuclear material is located. This approach conflicts with traditional approaches to providing effective defense-in-depth for nuclear materials. Safeguards and security managers are currently exploring ap-proaches to combining effective levels of security at these locations while achieving, wherever possible, greater levels of openness.

Savannah River Site

The Savannah River Site is located in South Carolina, roughly 25 miles southeast of Augusta, Georgia, in a predominantly rural farming area bordered to the west by the Savannah River. Historically, the mission of the Savannah River Site has been to produce several of the basic materials used in nuclear weapons, primarily plutonium and tritium. The recycling and reloading of tritium for the weapons program remains an important site mission, joined by new missions in areas ranging from the storage of nuclear materials to research and development. In addition, the Savannah River Site is also involved in a variety of environmental restoration and waste man-agement initiatives. Security interests at the Savannah River Site include large quantities of plutonium and highly enriched uranium, numerous classified weapons parts, a facility processing intelligence information, and a large amount of classified information in the form of documents, parts, and electronic media.

No significant weaknesses were noted in safeguards and security program imple-mentation. Noteworthy progress was noted in the

area of protection of special nuclear material. The site's ability to protect nuclear materials against theft is vastly improved over that of 1993, largely because of the relocation of nuclear materials out of Building 321-M, which had been a long-standing focus of serious concern over both the capabilities of the physical security system, and the site's ability to accurately control and account for the nuclear materials present in the facility. Adequate protection is also being provided to classified and sensitive information, whether in the form of documents, materials, or electronic systems and media. Finally, the site has made progress in dealing with radiological sabotage issues, both in overall programmatic terms, and specifically through the removal of the more sensitive target items at locations such as the HB-Line.

At a time when many other DOE sites are reducing or even eliminating their major national security assets, the Savannah River Site is planning to expand its role by storing additional nuclear materials it plans to receive from other DOE sites and from non-DOE facilities. In addition to making the need for effective protection systems even more important, this planned role will also increase the site's need to effectively manage the increased volume of classified and sensitive information that will accompany this long-term national security mission. This expanding protection mission will place increased demands upon the site's safeguards and security program planning and implementation.

The Savannah River Site has already taken positive steps to address some of these challenges. Of particular significance is the planned Actinide Packaging Storage Facility, intended to provide a highly secure underground storage capability. This facility is already in the design stage, with conceptual design review by site representatives scheduled for completion by December 1997. When completed, this facility should significantly ease the anticipated future burdens on existing nuclear material storage facilities on site.

Transportation Safeguards Division

The Transportation Safeguards Division, headquartered in Albuquerque, New Mexico, operates throughout the contiguous 48 states of the United States. It employs a fleet of specially designed highway transport vehicles to move special nuclear material, completed nuclear explosives, and other high value security assets. The division also uses DOE-owned aircraft to transport some weapons components and other classified material. Transportation Safeguards Division's primary mission is to provide for the safe, secure movement of nuclear weapons, strategic quantities of special nuclear materials, nuclear test devices, selected non-nuclear weapon components, and limited life com-ponents to and from military locations and between DOE nuclear complex facilities within the contiguous United States. An additional mission involves the provision of safe, secure transport for high value shipments on behalf of other agencies of the U.S. government.

No significant weaknesses were noted in safeguards and security program imple-mentation. Noteworthy progress includes im-plementation of an extensive and rigorous performance testing program and efforts to modernize the vehicle fleet.

Current management issues involve the increasing obsolescence of the Safe, Secure Trailer fleet. Transportation Safeguards Divi-sion management has long recognized this issue and has taken steps to resolve it through upgrades to the existing fleet and through procurement of a new generation trailer, termed the Safeguards Transporter. Although delivery of the first production trailer is anticipated for January 1998, recent indications suggest that funding shortfalls may lead to the cancellation of the program. Although cancellation will not likely lead to a crisis in the near term, it will force the division to re-examine its plans for sustaining an effective trailer fleet, deprive Transportation Safeguards Division manage-ment of its preferred solution to resolving the issue of its aging Safe-Secure Trailers, and will seriously complicate the task of maintaining sustainable low risk for nuclear material shipments.

A second issue involves the ability of the Transportation Safeguards Division to meet the challenges associated with an aging courier force. The average age of the courier force has steadily increased to 42 since 1992, when the last intake of new couriers took place. Man-agement projections indicate that the average age of the force will increase approximately one year each year for the foreseeable future. Although the age and experience of the courier force has its positive aspects, problems associated with age, chiefly in the form of increasing injury rates, will, over time, have an increasingly adverse impact upon overall program effectiveness.

These issues, as well as recent questions concerning the effectiveness of communication between Transportation Safeguards Division management and members of the courier force, are of sufficient weight to merit ongoing oversight.

Y-12 Plant

The Y-12 Plant is located in Oak Ridge, Tennessee. The current mission at the Y-12 Plant combines decontamination and decom-missioning of facilities formerly used for the fabrication of nuclear weapons components, chiefly involving the processing and machining of highly-enriched uranium. Other anticipated missions include support for nuclear weapons stockpile maintenance, lifetime extension, and reengineering, as well as the staging of significant quantities of highly enriched uranium pending its reprocessing into less attractive forms and concentrations. The Y-12 Plant also possesses significant numbers of classified documents and classified tooling and parts.

Although implementation of the Y-12 safeguards and security program is effective, some weaknesses exist that warrant increased attention.

Noteworthy progress has been made in implementing the necessary maintenance program to ensure that aging physical security systems continue to provide adequate and reliable protection. Similarly, an initiative is underway to replace an aging nuclear material accountability system with new hardware and software that will overcome long-standing weaknesses and provide expanded capabilities

Significant issues include weaknesses in procedures for vehicle search and personnel entry at the protected area boundary and a continuing inability to accurately measure some material quantities.